AIWA®

S/M Code No. 85-007
DATE OF ISSUE 3/1985

SERVICE MANUAL

TYPE. HB, UB, EB, KB

STEREO TURNTABLE SYSTEM

MODEL NO.
LX-80

STEREO TURNTABLE SYSTEM

MODEL NO.
LX-120

SPECIFICATIONS

LX-80

<Turntable Section>

Drive system	Fully automatic belt-drive turntable system
Motor	DC electronically regulated motor
Turntable platter	Aluminum alloy diecast
Speeds	33-1/3 and 45 rpm
Wow & flutter	0.055% (WRMS)
S/N ratio	70 dB (DIN-B)

<Tonearm Section>

Type	Linear tracking type, straight Dynamic type
Effective arm length	139.5 mm
Tracking error	10′

<Cartridge>

Type	VM type
Frequency response	20—20,000 Hz
Output voltage	2.5 mV

<General>

Power requirements	**LX-80 U** AC 120 V, 60 Hz **LX-80 E,** AC 220 V, 50/60 Hz **LX-80 K** AC 240 V, 50/60 Hz **LX-80 H** AC 120 V/220 V/240 V switchable, 50/60 Hz
Power consumption	10 W
Dimensions	330(W) ×85(H) ×330(D) mm (13″×3-3/8″×13″)
Weight	3.2 kg (7 lbs.)
Accessories	EP adaptor

- Design and specifications are subject to change without notice.

LX-120

<Turntable Section>

Drive system	Frequency generated direct drive system
Motor	4-phase 8-pole linear torque DD hall motor
Speeds	33-1/3 and 45 rpm
Wow & flutter	0.045% (WRMS)
S/N ratio	75 dB (DIN-B)

<Tonearm Section>

Type	Linear tracking type, straight dynamic type
Effective arm length	139.5 mm
Tracking error	10′

<Cartridge>

Type	VM type
Frequency response	20—20,000 Hz
Output voltage	2.5 mV (1 kHz 3.45 cm/sec)

<General>

Power requirements	**LX-120 U** AC 120 V, 60 Hz **LX-120 E,** AC 220 V, 50/60 Hz **LX-120 K** AC 240 V, 50/60 Hz **LX-120 H** AC 120 V/220 V/240 V switchable, 50/60 Hz
Power consumption	15 W
Dimensions	330(W) ×85(H) ×330(D) mm (13″×3-3/8″×13″)
Weight	3.5 kg (7.7 lbs.)
Accessories	EP adaptor

- Design and specifications are subject to change without notice.

ELECTRICAL MAIN PARTS LIST (LX-80, 120)

- +++ mark denotes a component of assembled part which part code is represented by a previously stated component.
- ★-mark means less required items and availabilities may be limited.

CAPACITORS No mark, U, UF: μF P, PF : pF
COILS MMH: mH UH : μH
FUSE MMA: mA

Ref.No.	Part.No.	Description
	=== IC ===	
	87-020-380	IC,LA2000S
	87-027-539	IC,LA3161
⚡	87-020-096	IC,M4066BP (LX-80 ONLY)
	87-020-148	IC,M5224P
	87-020-147	IC,M54547
⚡	84-127-650	IC,M58103-403SP
	87-020-343	IC,TA7354
⚡	87-027-827	IC,TC4069UBP
	=== TRANSISTOR ===	
	89-110-154	TRANSISTOR,2SA1015,Y
	89-318-154	TRANSISTOR,2SC1815,Y
	89-318-464	TRANSISTOR,2SC1846 (U ONLY)
	89-320-011	TRANSISTOR,2SC2001K
	89-412-753	TRANSISTOR,2SD1275
	89-414-063	TRANSISTOR,2SD1406 OY
	=== MAIN CIRCUIT BOARD SECTION ===	
PCB-A	*	MAIN CIRCUIT BOARD
C102	* 87-018-044	CAP,CERA-SOL S 1000P
C103	* 87-010-134	CAP,ELECT BP,4.7-35V
C107	* 87-018-044	CAP,CERA-SOL S 1000P
C109	* 87-018-044	CAP,CERA-SOL S 1000P
C110	* 87-010-134	CAP,ELECT BP,4.7-35V
C111	* 87-010-134	CAP,ELECT BP,4.7-35V
C120	* 87-018-047	CAP,CERA-SOL 0.01Y/16
C122	* 87-018-045	CAP,CERA-SOL 2200P
C124	* 87-018-047	CAP,CERA-SOL 0.01Y/16
C126	* 87-018-045	CAP,CERA-SOL 2200P
C134	* 87-018-047	CAP,CERA-SOL 0.01Y/16
C135	* 87-018-044	CAP,CERA-SOL S 1000P
C141	* 87-010-242	CAP,ELECT,1000-35VS (LX-80 ONLY)
C141	* 87-010-280	CAP,ELECT,2200-35V (LX-120 ONLY)
C147	* 87-018-047	CAP,CERA-SOL 0.01Y/16
C148	* 87-018-047	CAP,CERA-SOL 0.01Y/16
C154	* 87-018-047	CAP,CERA-SOL S 0.01Y/16 (LX-8 ONLY)
D101	87-027-097	DIODE,1S1555
D102	87-027-097	DIODE,1S1555
D103	87-027-097	DIODE,1S1555
D104	87-027-097	DIODE,1S1555
D105	87-027-097	DIODE,1S1555
D106	87-027-097	DIODE,1S1555
D107	87-027-097	DIODE,1S1555
D108	87-027-097	DIODE,1S1555
D109	87-027-097	DIODE,1S1555
D110	87-027-097	DIODE,1S1555
D111	87-027-097	DIODE,1S1555
D112	87-027-097	DIODE,1S1555
D113	87-027-097	DIODE,1S1555
D114	87-027-097	DIODE,1S1555
D115	87-027-097	DIODE,1S1555
D116	87-027-097	DIODE,1S1555
D117	87-027-097	DIODE,1S1555
D118	87-027-097	DIODE,1S1555
D119	87-027-097	DIODE,1S1555
D120	87-027-097	DIODE,1S1555
D129	87-027-097	DIODE,1S1555
D130	87-027-097	DIODE,1S1555
D131	* 87-027-943	LED,PR5751K (REPEAT)
D132	* 87-020-383	LED,PR57571-20 (PRG-1)
D133	* 87-020-383	LED,PR57571-20 (PRG-2)
D134	* 87-020-383	LED,PR57571-20 (PRG-3)
D135	* 87-020-383	LED,PR57571-20 (PRG-4)
D136	* 87-020-383	LED,PR57571-20 (PRG-5)
D137	* 87-020-383	LED,PR57571-20 (PRG-6)
D138	* 87-020-383	LED,PR57571-20 (PRG-7)
D139	* 87-020-377	LED,PG5731KY (OPERATE)
D140	* 87-027-943	LED,PR5751K (FG LOCK LX-120 ONLY)
D141	87-027-097	DIODE,1S1555
D142	87-027-097	DIODE,1S1555
D143	87-027-097	DIODE,1S1555 (LX-80 ONLY)
D144	87-027-349	DIODE,ZENER HZ6A1L
D145	87-027-556	DIODE,ZENER HZ11B3L (LX-80 ONLY)
D145	87-027-676	DIODE,ZENER HZ12B3LT2 (LX-120 ONLY)
D146	87-027-676	DIODE,ZENER HZ12B3LT2
D147	87-027-365	DIODE,S5277B
D148	87-027-376	DIODE,1B4B41
D149	87-027-097	DIODE,1S1555
L101	* 84-131-620	COIL,OSC 490K(T)
L102	* 87-003-051	COIL CHOKE 470UH
L103	87-005-126	COIL CHOKE 1000UH
R221	87-025-277	RES,MF 1/4W-2.2KF (LX-80 ONLY)
SFR1	* 87-021-747	SFR 220K
SFR2	* 87-021-745	SFR 47KB
SFR3	* 87-021-743	SFR 22K
SFR4	* 87-021-743	SFR 22K (LX-80 ONLY)
SFR5	* 87-021-741	SFR 4.7K (LX-80 ONLY)
SW1	84-131-621	PUSH SW,2-2 SUN 12.5 (POWER)
SW2	87-031-741	TACT SW (PRG1)
SW3	87-031-741	TACT SW (PRG2)
SW4	87-031-741	TACT SW (PRG3)
SW5	87-031-741	TACT SW (PRG4)
SW6	87-031-741	TACT SW (PRG5)
SW7	87-031-741	TACT SW (PRG6)
SW8	87-031-741	TACT SW (PRG7)
SW9	87-031-741	TACT SW (CLEAR)
SW10	87-031-741	TACT SW (INTRO PLAY/LIST)
SW11	87-031-741	TACT SW (LEFT)
SW12	87-031-741	TACT SW (RIGHT)
SW13	87-031-741	TACT SW (REPEAT)
SW14	87-031-741	TACT SW (F.SKIP)
SW15	87-031-741	TACT SW (B.SKIP)
SW16	87-031-741	TACT SW (START/CUT)
SW17	87-031-870	SLIDE SW 2-3 SSY (SENSOR)
SW18	87-031-869	SLIDE SW 2-2 SSY (SPEED)
SW20	87-031-741	TACT SW (UP/DOWN)
	=== REMOTE CIRCUIT BOARD SECTION ===	
PCB-B	*	REMOTE CIRCUIT BOARD
J1	84-131-617	STEREO JACK 3.5,M7T (REMOTE)
	=== POWER CIRCUIT BOARD SECTION ===	
PCB-C	*	POWER CIRCUIT BOARD
	=== POSITION SENSOR CIRUCIT BOARD SECTION ===	
PCB-D	*	POSITION SENSOR CIRCUIT BOARD
CP102	* 87-020-448	PHOTO INTERRUPTER GP-2S04CB
CP103	* 87-020-448	PHOTO INTERRUPTER GP-2S04CB
	=== ANGLE SENSOR CIRCUIT BOARD SECTION ===	
PCB-E	*	ANGLE SENSOR CIRCUIT BOARD
CP101	* 87-020-150	PHOTO INTERRUPTER KU107
	=== MISCELLANEOUS ===	
⚠	87-034-578	AC CORD (U) (U ONLY)
⚠	87-034-877	AC CORD (EE) (E ONLY)
⚠	87-034-958	AC CORD (H ONLY)
⚠	87-085-199	CORD BUSHING,2271
	* 84-133-617	SYNCHRATE CORD (CN) (H,E,K ONLY)
	* 84-133-637	SYNCHRATE CORD (U) (U ONLY)
	* 84-133-618	PIN CORD (CN) (H,E,K ONLY)
	* 84-133-638	PIN CORD (U) (U ONLY)
M1	84-133-627	MOTOR DC PHONO,MM1-5 ASSY (LX-80 ONLY)
M1	84-131-625	MOTOR DC PHONO,SS09AA (LX-120 ONLY)
M2	84-133-614	MOTOR DC,MMN-S (LINEAR DRIVE)
M3	84-133-613	MOTOR DC,PON-8 (UD) (UP/DOWN)
⚠ PT1	84-131-602	TRANSFORMER,PT (U) (U ONLY)
⚠ PT1	84-131-603	TRANSFORMER,PT (E) (E ONLY)
⚠ PT1	84-131-605	TRANSFORMER,PT (H) (H ONLY)
SW19	87-031-871	LEAF SW1-2 (UP/DOWN)
SW21	87-031-685	ROTARY SW (VOLTAGE SELECTOR) (H ONLY)

Note; Combination Circuit Board

The parts on the electrical parts list which are indicated by an asterisk (*) are supplied as one single combined circuit board. Therefore, they will not be supplied separately. If this becomes necessary, please order the entire circuit board.

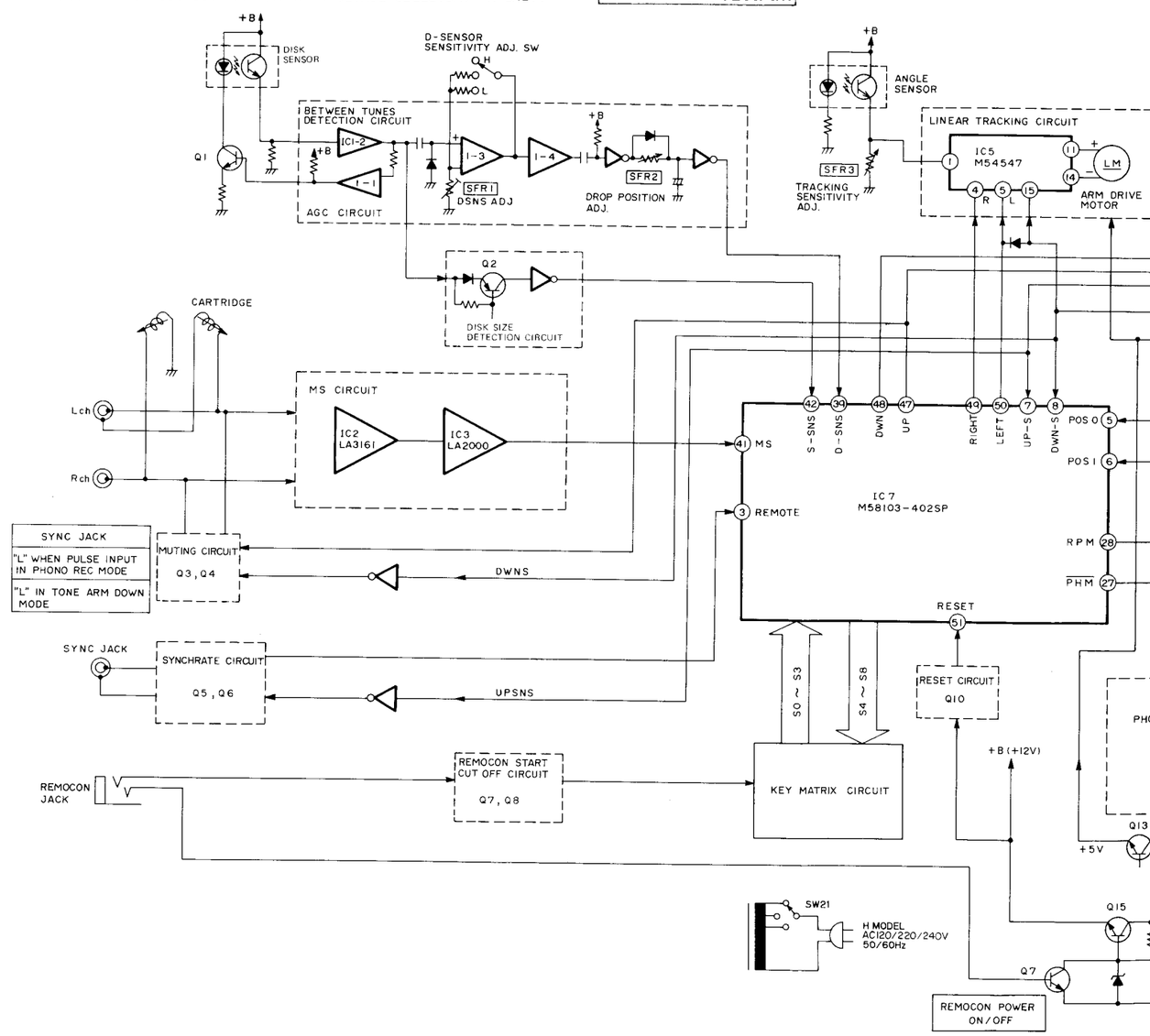
Combination Circuit Board:84-131-610

PCB-A	**84-131-611**
PCB-B	**84-131-612**
PCB-C	**84-131-613**

Combination Circuit Board:84-133-630

PCB-D	**84-133-630**
PCB-E	**84-133-632**

BLOCK DIAGRAM



X-80, 120)

- +++ mark denotes a component of assembled part which part code is represented by a previously stated component.
- ★ -mark means less required items and availabilities may be limited.

CAPACITORS No mark, U, UF: μF P, PF : pF
COILS MMH: mH UH : μH
FUSE MMA: mA

ption	Ref.No.	Part.No.	Description
	D135	★ 87-020-383	LED,PR57571-20 (PRG-4)
	D136	★ 87-020-383	LED,PR57571-20 (PRG-5)
	D137	★ 87-020-383	LED,PR57571-20 (PRG-6)
	D138	★ 87-020-383	LED,PR57571-20 (PRG-7)
NLY)			
	D139	★ 87-020-377	LED,PG5731KY (OPERATE)
	D140	★ 87-027-943	LED,PR5751K (FG LOCK LX-120 ONLY)
	D141	87-027-097	DIODE,1S1555
	D142	87-027-097	DIODE,1S1555
	D143	87-027-097	DIODE,1S1555 (LX-80 ONLY)
	D144	87-027-349	DIODE,ZENER HZ6A1L
	D145	87-027-556	DIODE,ZENER HZ11B3L (LX-80 ONLY)
	D145	87-027-676	DIODE,ZENER HZ12B3LT2 (LX-120 ONLY)
Y	D146	87-027-676	DIODE,ZENER HZ12B3LT2
Y	D147	87-027-365	DIODE,S5277B
(U ONLY)	D148	87-027-376	DIODE,1B4B41
	D149	87-027-097	DIODE,1S1555
	L101	★ 84-131-620	COIL,OSC 490K(T)
OY	L102	★ 87-003-051	COIL CHOKE 470UH
	L103	87-005-126	COIL CHOKE 1000UH
	R221	87-025-277	RES,MF 1/4W-2.2KF (LX-80 ONLY)
	SFR1	★ 87-021-747	SFR 220K
	SFR2	★ 87-021-745	SFR 47KB
P	SFR3	★ 87-021-743	SFR 22K
V	SFR4	★ 87-021-743	SFR 22K (LX-80 ONLY)
P			
	SFR5	★ 87-021-741	SFR 4.7K (LX-80 ONLY)
P	SW1	84-131-621	PUSH SW,2-2 SUN 12.5 (POWER)
V	SW2	87-031-741	TACT SW (PRG1)
V	SW3	87-031-741	TACT SW (PRG2)
16			
	SW4	87-031-741	TACT SW (PRG3)
	SW5	87-031-741	TACT SW (PRG4)
16	SW6	87-031-741	TACT SW (PRG5)
	SW7	87-031-741	TACT SW (PRG6)
16			
	SW8	87-031-741	TACT SW (PRG7)
P	SW9	87-031-741	TACT SW (CLEAR)
(LX-80 ONLY)	SW10	87-031-741	TACT SW (INTRO PLAY/LIST)
(LX-120 ONLY)	SW11	87-031-741	TACT SW (LEFT)
16			
	SW12	87-031-741	TACT SW (RIGHT)
16	SW13	87-031-741	TACT SW (REPEAT)
Y/16 (LX-8 ONLY)	SW14	87-031-741	TACT SW (F.SKIP)
	SW15	87-031-741	TACT SW (B.SKIP)
	SW16	87-031-741	TACT SW (START/CUT)
	SW17	87-031-870	SLIDE SW 2-3 SSY (SENSOR)
	SW18	87-031-869	SLIDE SW 2-2 SSY (SPEED)
	SW20	87-031-741	TACT SW (UP/DOWN)

=== REMOTE CIRCUIT BOARD SECTION ===

PCB-B	*	REMOTE CIRCUIT BOARD
J1	84-131-617	STEREO JACK 3.5,M7T (REMOTE)

=== POWER CIRCUIT BOARD SECTION ===

PCB-C	*	POWER CIRCUIT BOARD

=== POSITION SENSOR CIRUCIT BOARD SECTION ===

PCB-D	*	POSITION SENSOR CIRCUIT BOARD
CP102	★ 87-020-448	PHOTO INTERRUPTER GP-2S04CB
CP103	★ 87-020-448	PHOTO INTERRUPTER GP-2S04CB

=== ANGLE SENSOR CIRCUIT BOARD SECTION ===

PCB-E	*	ANGLE SENSOR CIRCUIT BOARD
CP101	★ 87-020-150	PHOTO INTERRUPTER KU107

Ref.No.	Part.No.	Description
=== MISCELLANEOUS ===		
	87-034-578	AC CORD (U) (U ONLY)
	87-034-877	AC CORD (EE) (E ONLY)
	87-034-958	AC CORD (H ONLY)
	87-085-199	CORD BUSHING,2271
	★ 84-133-617	SYNCHRATE CORD (CN) (H,E,K ONLY)
	★ 84-133-637	SYNCHRATE CORD (U) (U ONLY)
	★ 84-133-618	PIN CORD (CN) (H,E,K ONLY)
	★ 84-133-638	PIN CORD (U) (U ONLY)
M1	84-133-627	MOTOR DC PHONO,MM1-5 ASSY (LX-80 ONLY)
M1	84-131-625	MOTOR DC PHONO,SS09AA (LX-120 ONLY)
M2	84-133-614	MOTOR DC,MMN-S (LINEAR DRIVE)
M3	84-133-613	MOTOR DC,PON-8 (UD) (UP/DOWN)
PT1	84-131-602	TRANSFORMER,PT (U) (U ONLY)
PT1	84-131-603	TRANSFORMER,PT (E) (E ONLY)
PT1	84-131-605	TRANSFORMER,PT (H) (H ONLY)
SW19	87-031-871	LEAF SW1-2 (UP/DOWN)
SW21	87-031-685	ROTARY SW (VOLTAGE SELECTOR) (H ONLY)

Note; Combination Circuit Board

The parts on the electrical parts list which are indicated by an asterisk (*) are supplied as one single combined circuit board. Therefore, they will not be supplied separately. If this becomes necessary, please order the entire circuit board.

Combination Circuit Board:84-131-610

PCB-A	84-131-611
PCB-B	84-131-612
PCB-C	84-131-613

Combination Circuit Board:84-133-630

PCB-D	84-133-630
PCB-E	84-133-632

C-MOS IC handling precaution

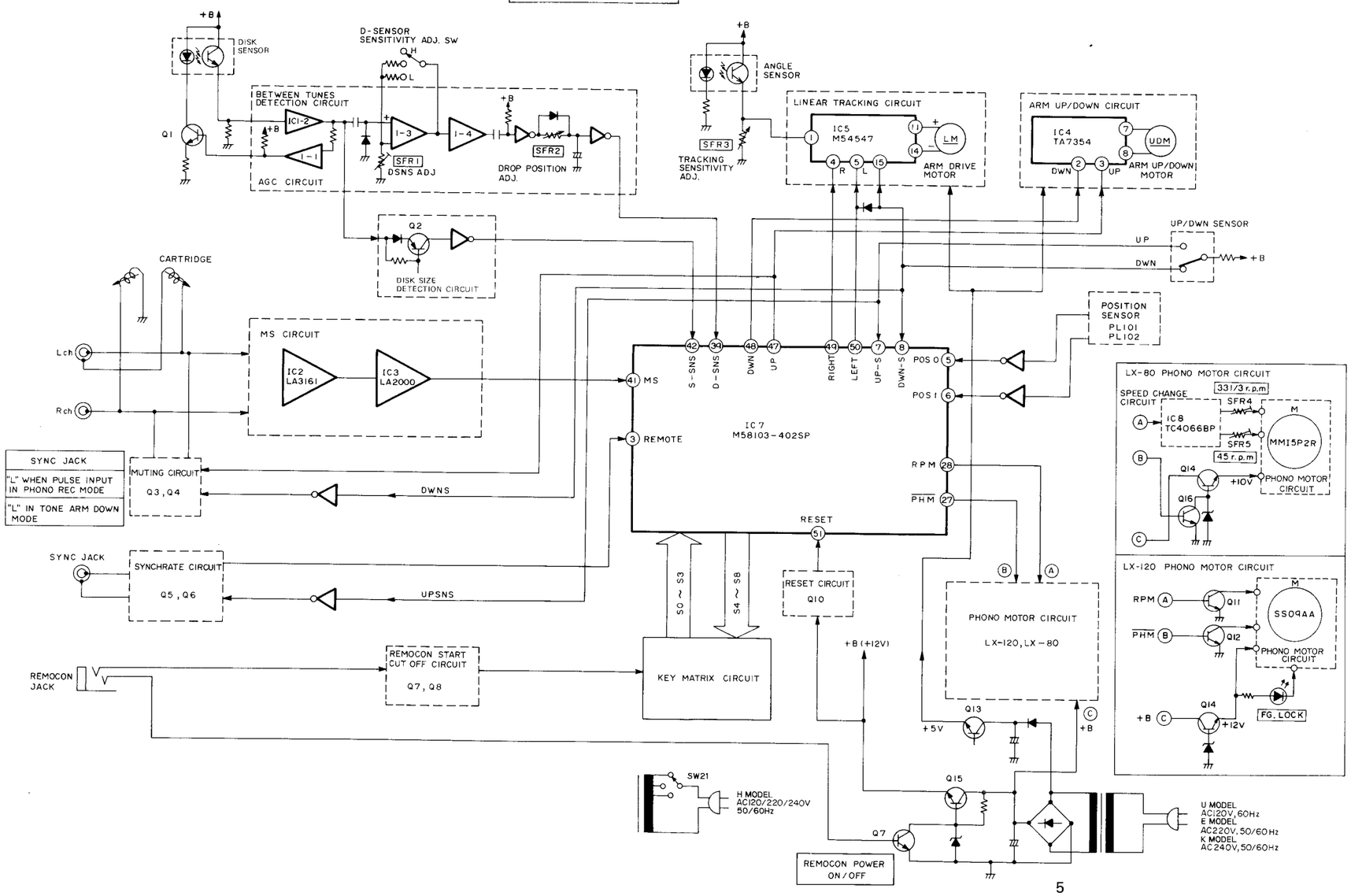
The C-MOS IC's construction makes this part susceptible to damage by static electricity and so take sufficient care in regard to following articles.

1. Need to be put on conductive sheet, to be put in a metallic box and to be wrapped by aluminium foil for transportation and deposit.
2. To use solder iron less than 40W (less than 260℃) of power consumption for soldering. But do not overheat more than 10 second.
3. Do not perform a conductivity test with a tester, etc. Refer to the circuit voltages of each part.
4. The ICs on the electrical parts which are indicated by an C-MOS IC symbol mark (⚡).

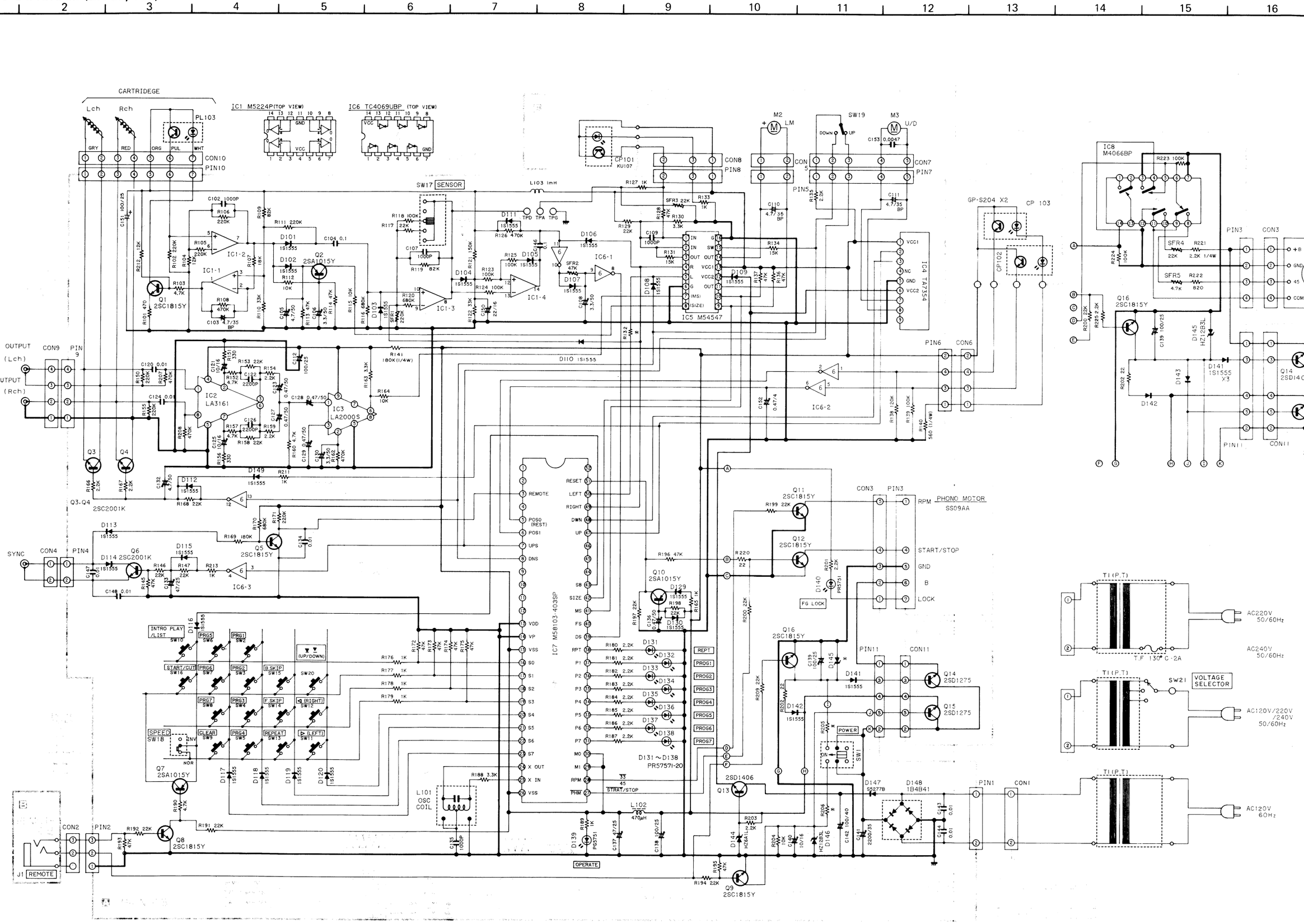
⚠ Safety component symbol

This symbol is given to important parts which serve to maintain the safety of the product, and which are made to conform to special safety specifications. Therefore, when replacing a component with this symbol, make absolutely sure that you use a designated part.

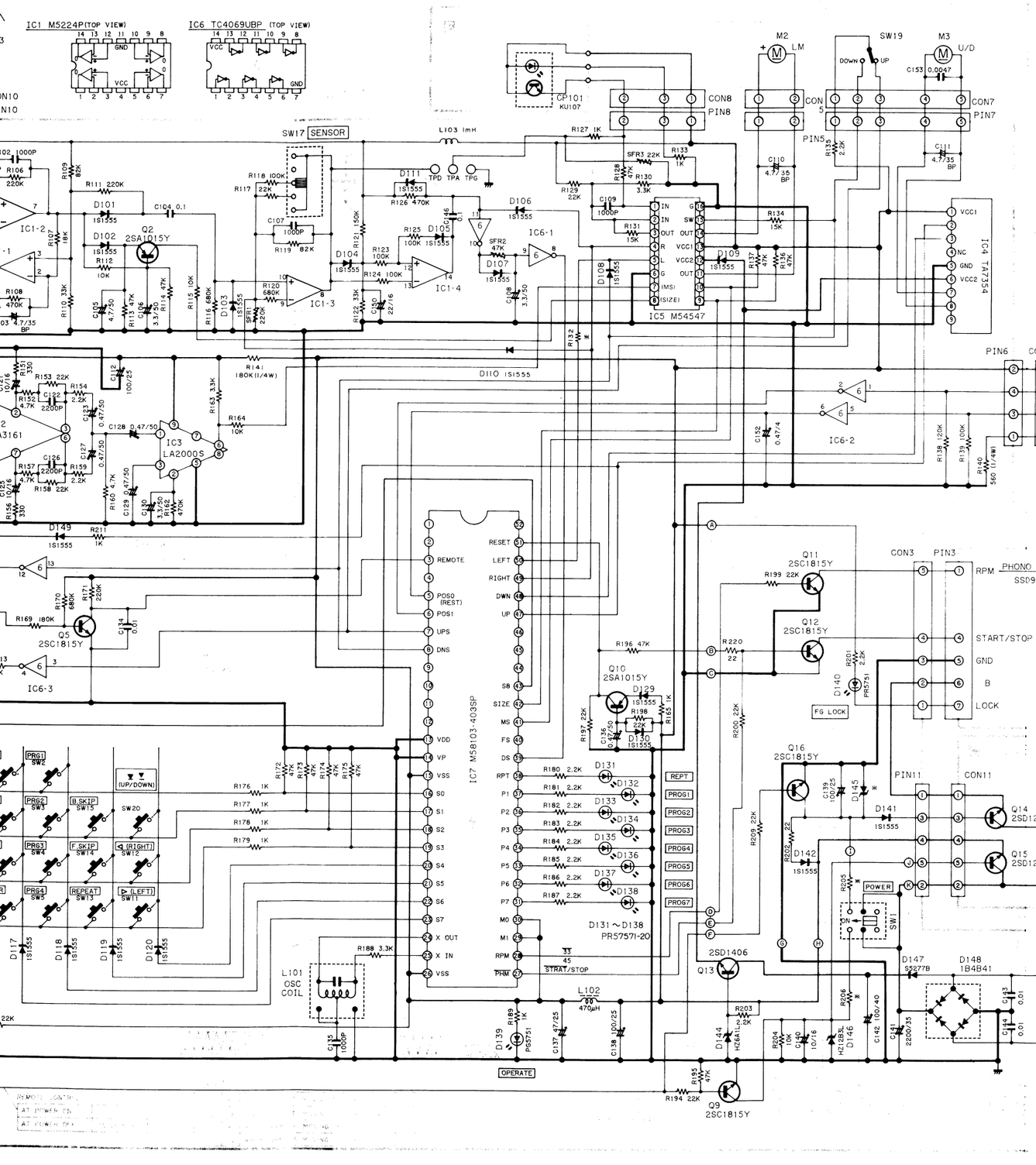
BLOCK DIAGRAM



SCHEMATIC DIAGRAM (LX-80, 120)



6 7 8



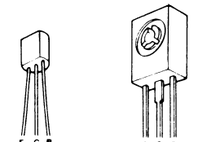
NOTES:

1) B (+) power supply
2) The voltage is the reference value measured with a tester (20 k-ohms/V DC) when there are no signals.
3) Resistors with no designation have a rated power of 1/8W and a tolerance of ±5%.
4) Capacitors with no designation have a dielectric strength of less than 50WV.
5) The only capacitor tolerance indicated are ±5% (J) and ±10% (K).
6) Ceramic capacitor symbols:
   - For temperature compensation (SL)
   - High dielectric constant system (YY)
   - High dielectric constant system (YW, YP, YZ)
   - Semiconductor ceramic
   - For temperature compensation (SH)

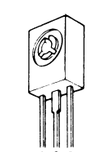
   Explanation of symbols
   (BP) Bi-polarized capacitor

   Safety component symbol

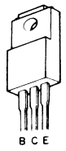
   This symbol is given to important parts which serve to maintain the safety of the product, and which are made to conform to special safety specifications.
   Therefore, when replacing a component with this symbol, make absolutely sure that you use a designated part.
- This schematic diagram is subject to change without notice in the interests of improved performance.



2SA1015
2SC1815
2SC2001



2SC1846

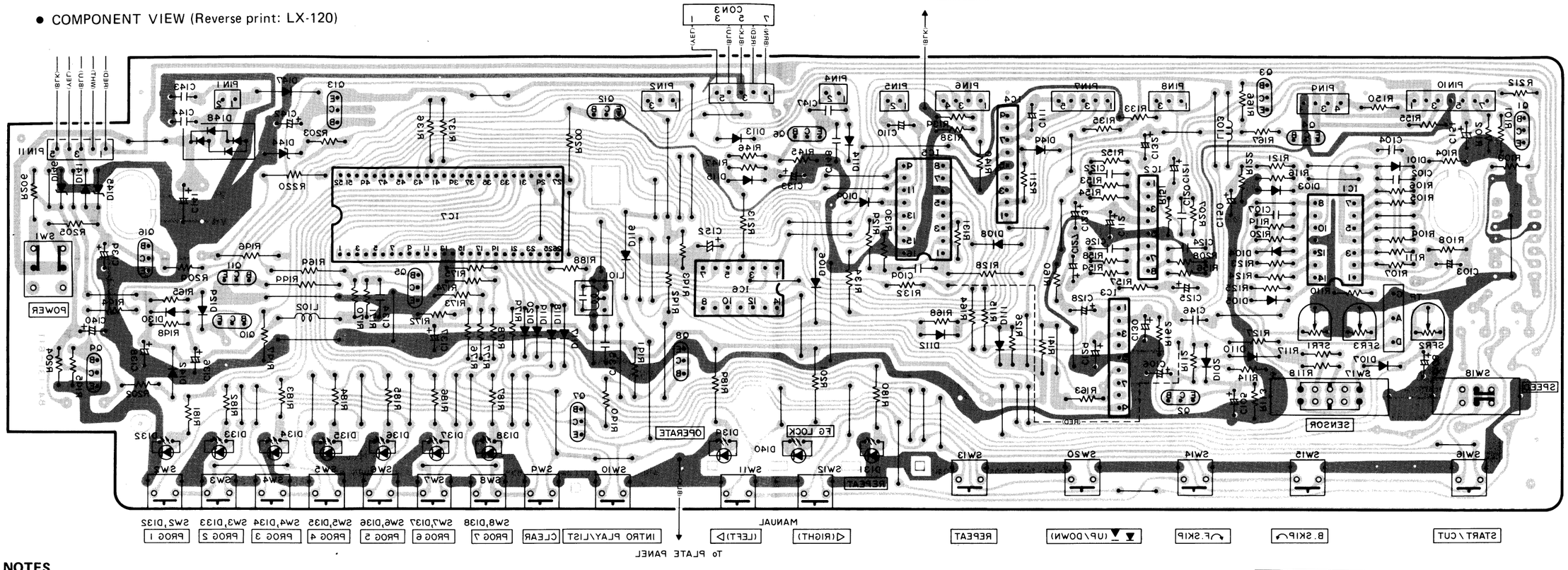


2SD1275
2SD1406

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

A B C D E F G H I J K

● COMPONENT VIEW (Reverse print: LX-120)

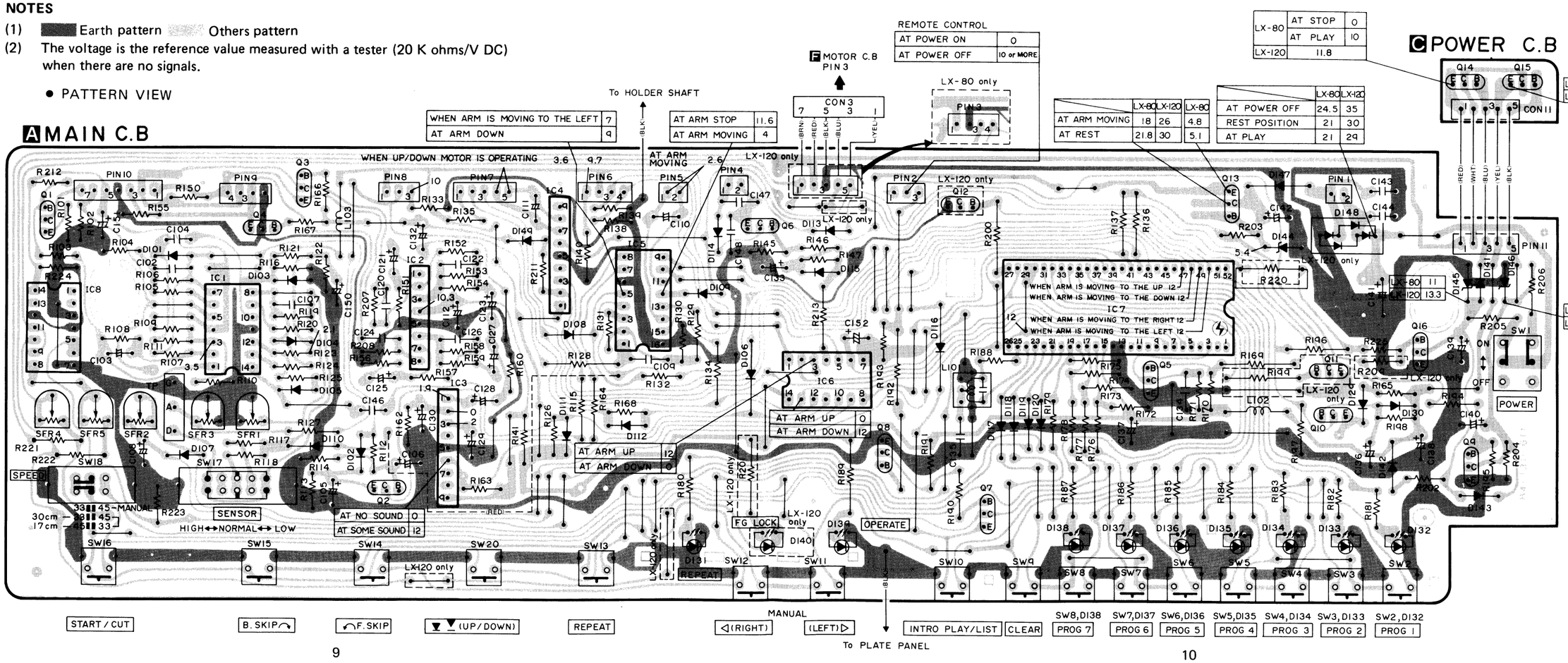


NOTES

(1) Earth pattern Others pattern

(2) The voltage is the reference value measured with a tester (20 K ohms/V DC) when there are no signals.

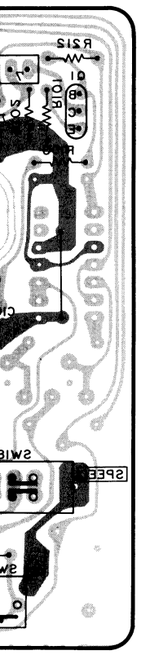
● PATTERN VIEW

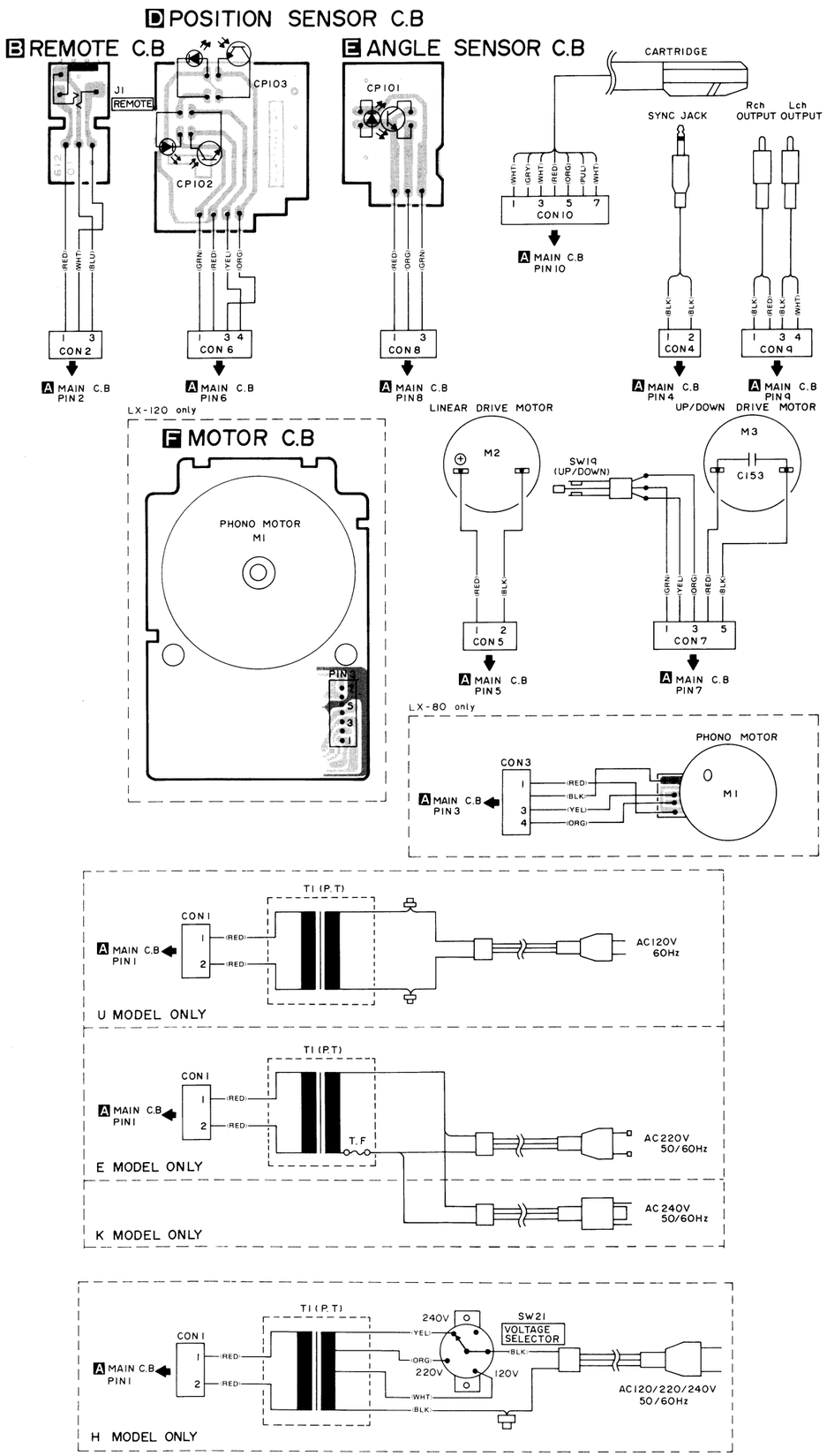


	LX-80	LX-120	LX-80
AT ARM MOVING	18	26	4.8
AT REST	21.8	30	5.1

	LX-80	LX-120
AT POWER OFF	24.5	35
REST POSITION	21	30
AT PLAY	21	29

LX-80	12.8
LX-120	12.6
LX-80	11
LX-120	13.3
LX-80	13.4
LX-120	13.7





IC Pin Description

※ As to TA7354P (IC4) and M54547 (IC5), see the service manual of LX-20.

Pin No.	Pin mark	Function
1.2	———	Not used.
3	REMOTE	Remote control input. Start performance at the rise to "HIGH" from "LOW".
4	———	Not used.
5	POST 0	Detects the amount of movement of the tone arm by counting the position sensor input pulses.
6	POST 1	Tone arm movement range detection input. The arm can move within a certain range at "L" level.
7	UP-S	Tone arm UP sensor input. "H" during UP operation.
8	DN-S	Tone arm DOWN sensor input. "H" during DOWN operation.
9.10.11	———	Not used.
12	———	Not used.
13	V_{PP}	GND
14	Vss	+12V
15	———	Not used.
16~19	$S_0 \sim S_1$	Key inputs
20~23	$S_4 \sim S_7$	Key matrix outputs
24	X_0	Clock output. ∿ 6Vp-p, 500kHz
25	X_1	Clock input. ∿ 12Vp-p, 470kHz
26	Vss	+12V
27	$\overline{PHM}$	Phonomotor ON/OFF control output. Rotates at "L" and stops at "H"
28	RPM	Phonomotor speed control output. "L" : 33 rpm "H" : 45 rpm
29	M_1	+12V
30	M_0	+12V
31 ∫ 37	PRG7 ∫ PRG1	Program No. LED indication outputs. Lit at "H".
38	REPEAT	REPEAT indication output. Lit at "H".
39	D.S	Disc sensor input. The rise to "H" from "L" is set to becomes the input.
40	———	Not used.
41	MS	Performance finish signal input.
42	SS	Record size detection input. The rise from "L" to "H" is the input.
43	S_8	Key matrix output.
44~46	———	Not used.
47	UP	Arm UP output. "H" during arm UP operation.
48	DOWN	Arm DOWN output. "H" during arm DOWN operation.
49	RIGHT	Arm rightward movement output. "H" during arm movement to the right.
50	LEFT	Arm leftward movement output. "H" during arm movement to the left.
51	RST	RESET-input. Reset when "H" level is applied for the period of 36μs or more.
52	———	Not used.

Preparation for Adjustment

Adjusting components are covered with two plates ... Plate O and Plate U. Before performing the following adjustment, remove the plate O, which is under the tonearm, by pushing against with a screwdriver from the bottom side, and take off the plate U, which is on the right hand corner, with a knife.

Plate O ... Refer to the paragraph of "Disassembly Instruction".
Plate U ... Detach the bottom steel plate to find out the adjusting components on the circuit board, if it is difficult to remove the plate U.

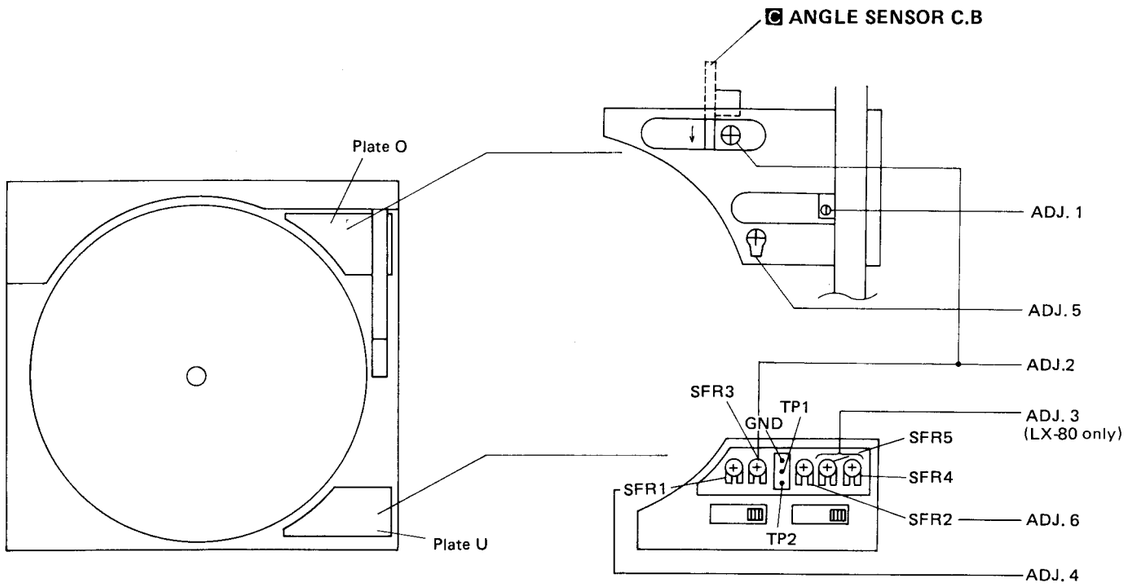


Fig. 1

1 <Stylus Height Adjustment>

1) Using Jig
Move the tonearm near the lead-in position of 30cm disc size by pressing the "MANUAL" key, and switch power off.
Place the height measuring jig under the stylus and turn the adjusting screw to locate the stylus between the steps (4.0 and 4.5mm) as illustrated.

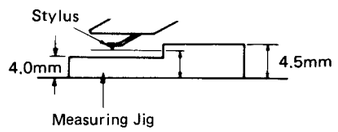


Fig. 2

2) Using EP Adaptor
Place the original EP adaptor of these models close to the cartridge, and turn the adjusting screw to locate the illustrated part of the cartridge at the shoulder of the EP adaptor.
※ In case the bottom steel plate is detached, the stylus height increases by 0.5mm even if the turntable is set flat.

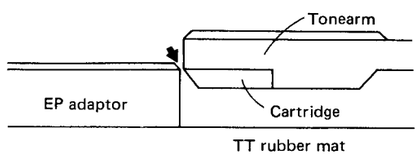


Fig. 3

2 <Angle Sensor Adjustment>

1) Remove the belt from the motor pulley and move the tonearm near the lead-in position of 30cm disc size by pressing the "MANUAL" key.
※ LX-120: To stop the turntable, pull off the connector for the phono-motor or catch the turntable by hand.
2) Turn the adjusting screw to locate the C angle sensor circuit board fully frontward. Then adjust SFR3 for 4.5±0.5V at the test point TP1.
3) Turn the adjusting screw again to obtain 1.0±0.1V at the same test point.
4) Confirm that the voltage satisfies 0.7±1.2V at the same test point when lowered the tonearm.
5) If the specified voltage is not satisfied in Step 4), swing the tonearm lightly to the left and right to get a good balance. Then perform the above procedure again.

3 <Motor Speed Adjustment>

(LX-80 only)

Play the 3kHz section of the test disc (ATR-003). Adjust SFR4 for 3,050±10Hz in the 33rpm speed mode, and adjust SFR5 for 4,060±10Hz in the 45rpm speed mode.

4 <Disc Sensor (D Sensor) Adjustment>

Complete the "Stylus Height" adjustment before performing the following procedure.

1) Switch the sensitivity selector to the "NORMAL" position.
2) LX-80: To stop the turntable, remove the belt from the motor pulley.
LX-120: To stop the turntable, catch the turntable by hand.
3) Put a mark on the test disc (ATR-004) as follows: Draw a line between the center hole and the halfway point of the 7th feed-groove, which is located between the 6th track "no sound groove" and the 7th track "wow and flutter check-3kHz", with eyes. Then put an arrow mark on the label at right angle against the above line as shown in Fig. 4.

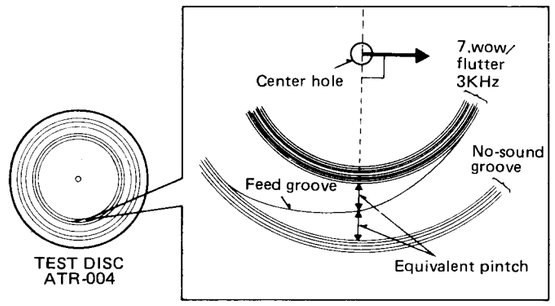


Fig. 4

4) Connect oscillator to the test point TP-2 (D sensor) with 10:1 probe.
5) Set the test disc so that the arrow mark points to the arm rest.
6) Move the tonearm by pressing the "MANUAL" key until it passes through the 7th feed-groove, observing waveforms in the oscilloscope. An waveform of 3.0 to 3.5V will be occurred when the tonearm passed through the 7th feed-groove.
If not, adjust SFR1 for the specified value.

Sensitivity selector	NORMAL
Speed mode	33rpm

Waveform occurring when passing through the 7th feed-grrove

Fig. 5

7) Return the tonearm to the arm rest once and perform Step 6 again in order to confirm the specification.

5 <Auto-In/Out Adjustment>

Play the test disc (ATR-003) in the 45rpm speed mode. Turn the adjusting screw so that the auto-in count becomes 32±2 in 17cm disc mode, and confirm that the auto-out count becomes 15 or more in 17cm disc mode.
Then confirm, in 30cm disc mode, that the auto-in count becomes 20 to 28 and the auto-out count makes 11 to 14.

6 <Stylus Drop Position Fine Adjustment>

By adjusting SFR2, a drop position of the stylus enables to be varied by 1 to 2mm right or left.

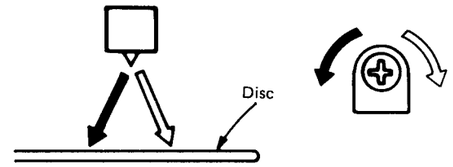


Fig. 6

ent >
rpm speed mode.
count becomes
the auto-out

uto-in count
es 11 to 14.

n Fine

e stylus enables

Fig. 6

CIRCUIT DESCRIPTION

PROGRAM TUNE-SELECTION MECHANISM

1. Outline

When the tuner is selected by the program button operation and the START button is pressed, the arm moves to the internal circumference while it is kept in the UP state. The inter-tune position is detected by the disc sensor during this movement and memorized by the microcomputer. The size is sensed simultaneously at this time. The arm moved to the internal circumference moves to the 1st tune of the program and is lowered. When the performance starts (when the arm is lowered), the MS circuit works; when the no-signal state continues for 1.5sec or more, the circuit makes the arm move UP and the arm moves to the 2nd tune. (It moves to the next tune directly without returning to the arm rest.)

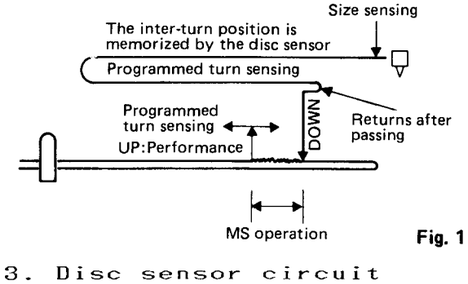


Fig. 1

2. Memorizing inter-tune position

Slits are engraved with a pitch of 1mm on the mark (black mutal plate) of the position sensor as well as holes which sense the rest position, 30cm records and 17cm records. The number of slits before the slit where the inter-tune signal is output is sensed by the microcomputer, to sense the inter-tune position. (The microcomputer, counts 1, 2, 3, 4... every time the position sensor passes the slit.)

a. Inter-tune position sensing slit

Note) LX-80 and 120 are provided with a reflective type of element. An accurate clearance (0.5 to 1.5mm), therefore, must be required between this element and the reflection plate.

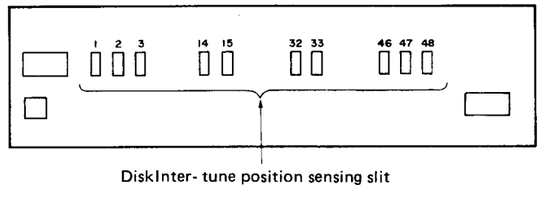


Fig. 2

3. Disc sensor circuit

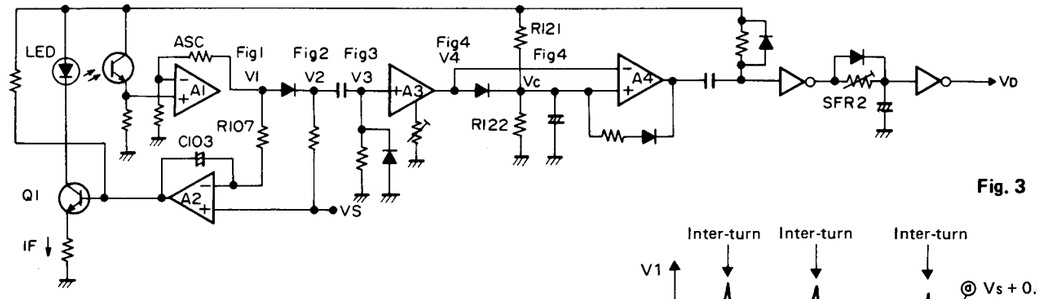


Fig. 3

1) Light from the LED is reflected by the record, enters the phototransistor and is converted to current. This signal is amplified by A1 of IC205, and V_1 is obtained. This output V_1 is compared with the reference voltage Vs, and controlled by the time constant of R107 and C103 so that $V_1 = Vs$. (When the amount of light entering the photo transistor increases, the internal resistance of Q1 is increased to dim the LED so that the amount of light incident on the photo transistor is always kept constant.)
2) When the arm passes the inter-tune, the incident amount of light is increased, but the time constant T is smaller than R107 · C103, so the waveform as V_1 shown in Fig. 1 is obtained.
3) When the waveform is sliced by the dot line (a) via the slice circuit, the waveform shown as V_2 in Fig. 2 is obtained.
4) By differentiating this, the waveform shown as V_3 in Fig. 3 is obtained.
5) By amplifying this via A3, the waveform shown as V_4 in Fig. 4 is obtained: Vc is obtained by peak-holding this.

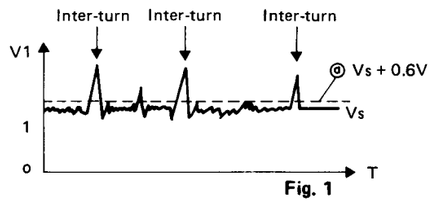


Fig. 1

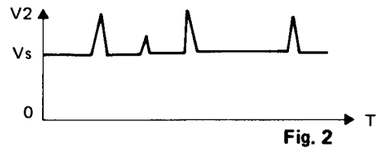


Fig. 2

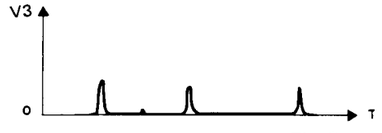


Fig. 3

Fig. 4

6) A_4 is a comparator with hysteresis, and it compares V_4 and Vc, and makes the rise of its output V_0 the intertune sensing signal. (Refer to Fig. 5)
Fig. 5 a. Inter-tune sensing signal
7) The signal V_0 is differentiated to rectify the waveform and is led into the IC7 as an inter-turn signal, adjusting the drop position of the stylus with SFR2.

Note) The drop position of the stylus enables to be varied in the range of 1 to 1.5mm.

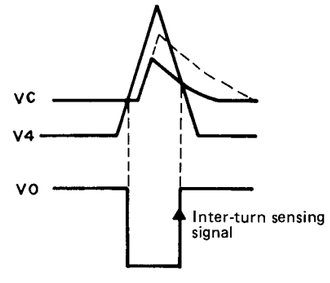


Fig. 5

4. MS circuit

1) When the arm is lowered, muting of Q211, Q212 is released and the signal enters the MS circuit.
2) When the arm comes the ±1 count (Slit No. of the mask sensor) of the inter-tune position which was sensed previously during the arm UP operation, the microcomputer (IC7) starts to monitor the MS signal.
3) When the no-sound state continues for 1.5sec or more, it is judged as inter-tune and the arm lifts. (However, when the programmed numbers continue, the arm does not lift but the performance is continued as it is.) (MS sensitivity is not related to the positions of SW17 and the sensor switch (LOW, NOR, HIGH).)

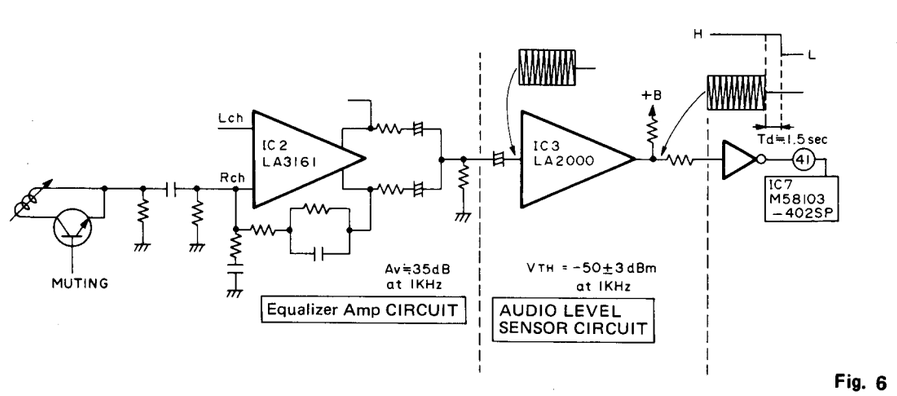


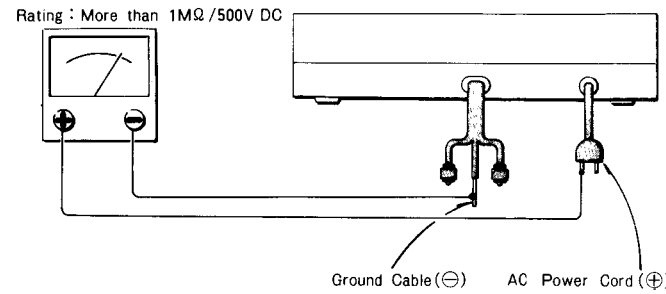
Fig. 6

4) Connect the both output cords, Lch and Rch, to the input pins of the amplifier, or connect the earth side of the output cords to ground. Otherwise, the MS circuit may cause malfunction.

Follow the instructions carefully, which will allow the user to optimise the products' performance and give many years of serivce.

1. **No scratch and melting shall be made to covered lead-wires of an a.c. primary circuit including mains leads.**
2. **No illegibility shall be given to the specification plate, the caution labels, the fuse labels and others.**
3. **When, on pattern sides of circuit boards, additional repair-parts have been made up, the parts shall be firmly glued to circuit boards or other components, unless the parts can be attached firmly.**
4. **The following matters shall be maintained as they are, when repairing.**
   1) Soldering of lead-wire ends
      * Care should be taken of the space distance in an a.c. primary circuit as well as soldering.
   2) Wiring and holding of lead-wires with wire-clips and binders
   3) Materials of lead-wires
      * e.g.; For UL models, lead-wires to be used shall be approved or accepted by the UL.
   4) Location of all kinds of insulators
   5) Setting of voltage selector switch
      * Set the Voltage Selector Switch to 240V, 220V, or 120V, According to your Local Voltage.
5. **After repaired, the insulation resistance or leakage current shall be measured with 500 ± 5V D.C and shall be not less than 1MΩ.**

Measuring Point



☆ **MEMO** ☆

DISASSEMBLY INSTRUCTIONS

1. Bottom Lid Removal

1) Remove the dust cover and turntable.
2) Remove the 5 screws to detach the bottom lid.
(See Figure-1)

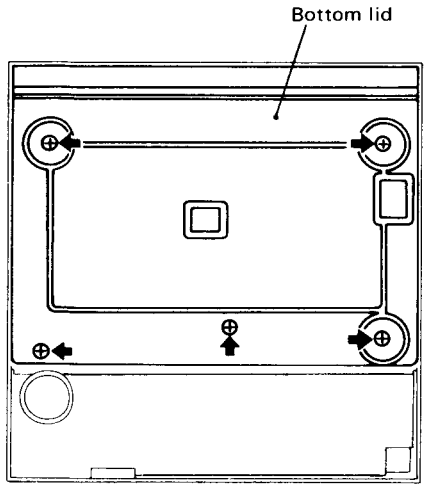


Fig. 1

2. Main C.B. Removal

1) Remove the 2 screws and unhook the 3 holders.
(See Figure-2)

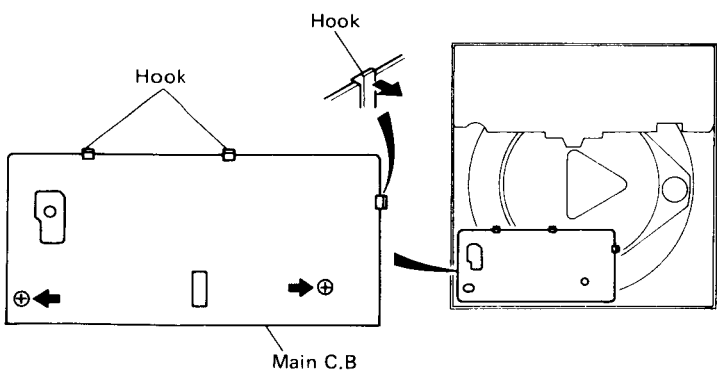


Fig. 2

3. Bottom Cabinet Removal

1) Remove the 5 screws. (See Figure-3)

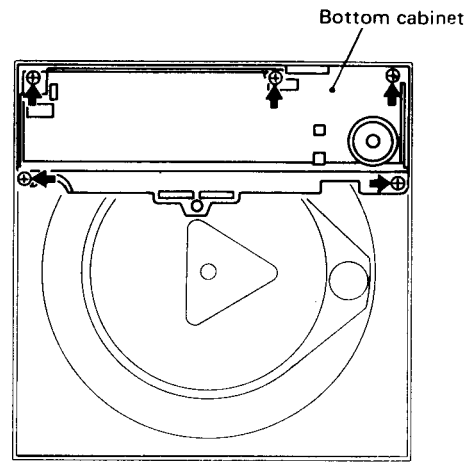


Fig. 3

2) Move the tonearm to the illustrated position to detach the main cabinet upward.

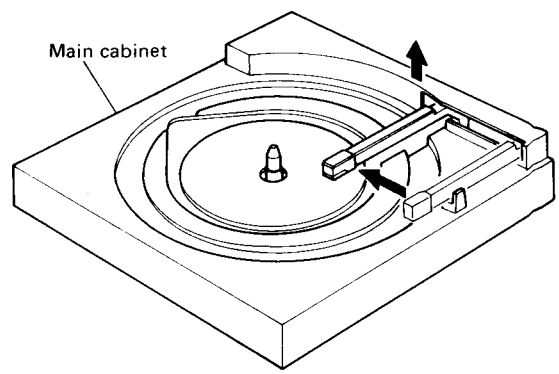


Fig. 4

The following check method may be useful for servicing, because these models (LX-80, 120) are provided with no main bottom chassis.

4. C.B. Check by Turntable Operation

1) General operation enables to be performed even though raised the front side of the cabinet by 7 ~ 8 cm. So, set the turntable with using of cassette cases as shown and check the circuit board from the component side. (See Figure - 5)

Note: Set the turntable flat when performing the adjustments, otherwise correct figures can not be obtained.

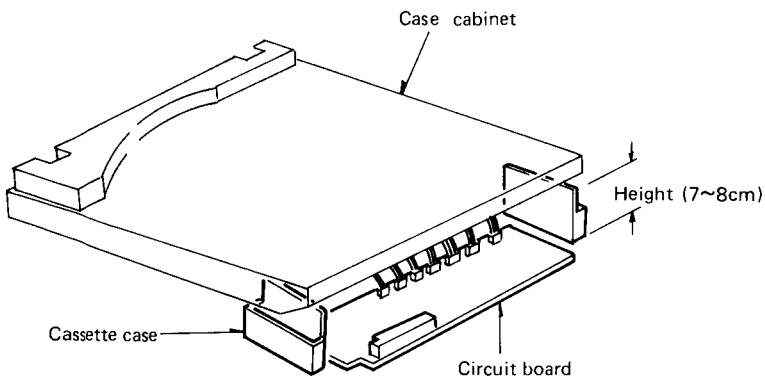


Fig. 5

5. Mechanism Part Replacement and C.B. Check by Tonearm Operation (with Turntable Removed)

1) Detach the turntable and turn the cabinet upside down.
2) Remove the mechanism chassis and set it as illustrated, placing in parallel with the circuit board. Take care of the tonearm leadwires, otherwise the tonearm may be stuck.

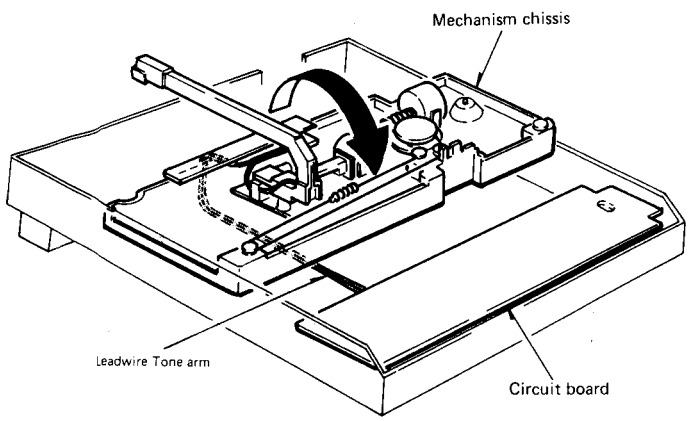


Fig. 6

3) Stop the phono motor by pulling off the motor connector, if necessary.

6. Blind Plate Removal

Before performing the adjustment, remove the blind plate because the adjusting pins are situated underneath this plate. Proceed as follows:

1) Move the tonearm to the illustrated position. (See Figure - 7)

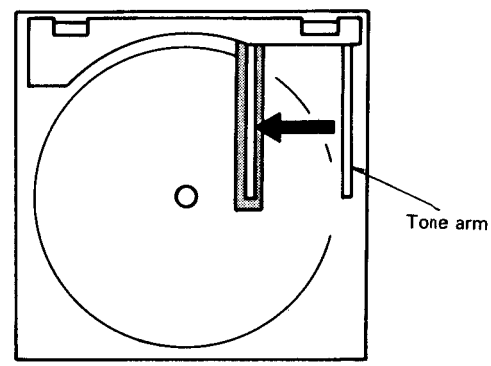


Fig. 7

2) Insert a screwdriver into the illustrated openning on the bottom cabinet and push against the blind plate to take off. (See Figure - 8)

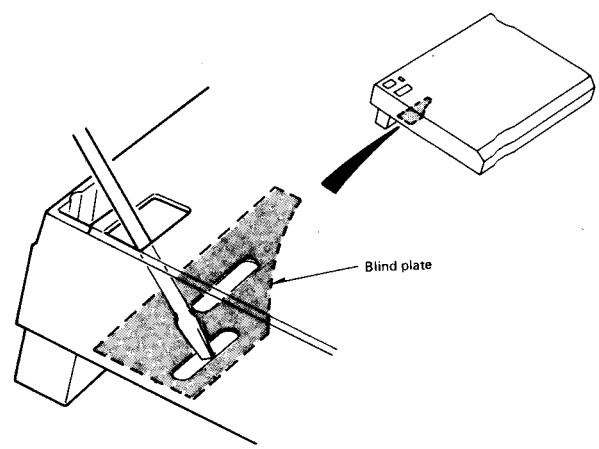
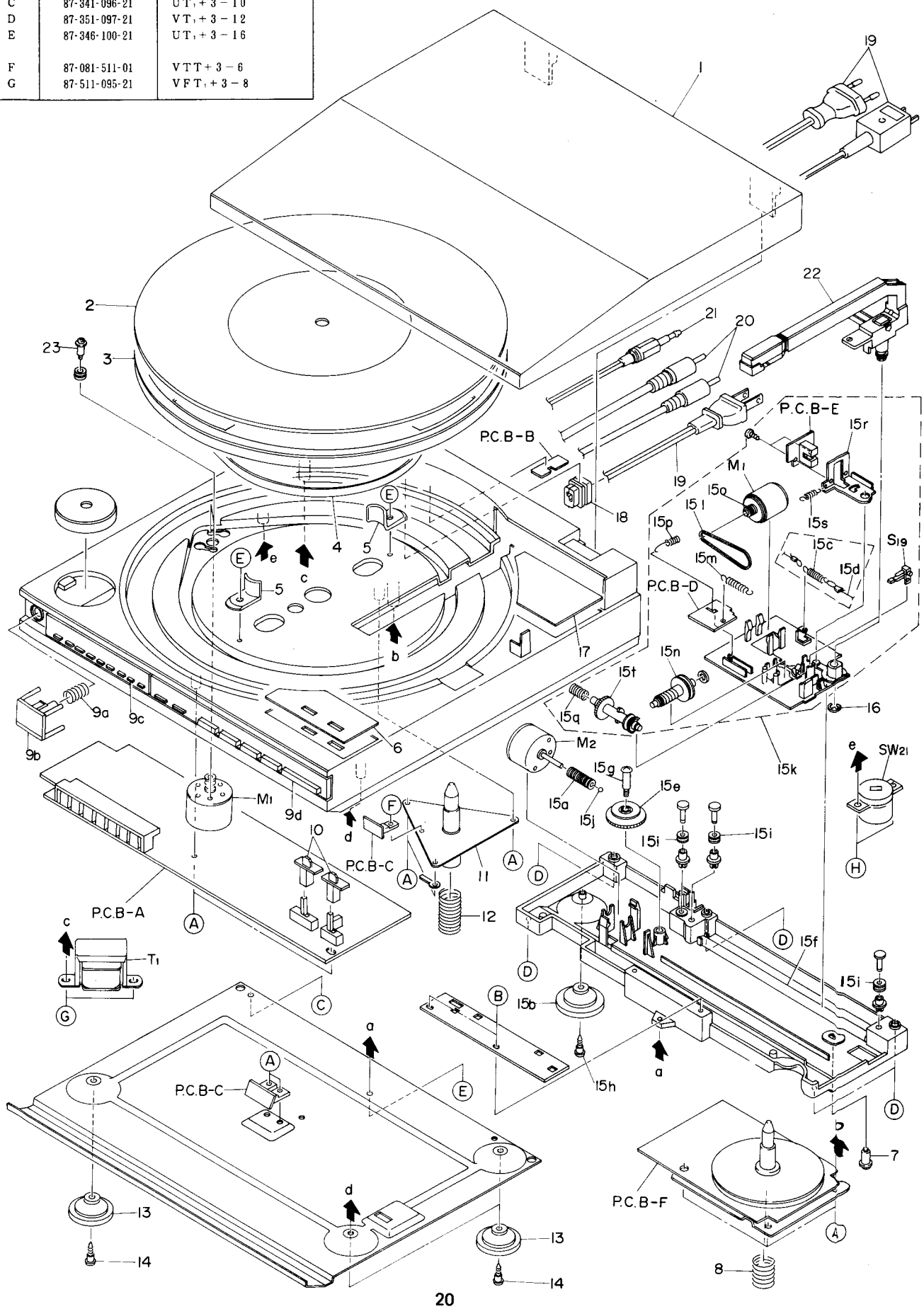


Fig. 8

EXPLODED VIEW

Ref. No.	Part No.	Description
A	87-341-095-21	UT₁+3−8
B	87-356-094-21	VT₁+3−6
C	87-341-096-21	UT₁+3−10
D	87-351-097-21	VT₁+3−12
E	87-346-100-21	UT₁+3−16
F	87-081-511-01	VTT+3−6
G	87-511-095-21	VFT₁+3−8



MECHANICAL PARTS

- ※ mark in this part list shows exclusive part.
- ★mark means less required items and availabilities may be limited.

Part No. changed to	Ref. No.	Part No.	Description	Common Model	Q'ty
	1	84-133-011	DUST COVER Ass'y (LX-80)	LX-30	1
		84-131-018	DUST COVER Ass'y (LX-120)	※	1
	2	★84-132-016	RUBBER SHEET (LX-80) (H, E, K only)	※	1
		★84-132-017	RUBBER SHEET (LX-80) (U only)	※	1
		★84-131-043	RUBBER SHEET (LX-120) (H, E, K only)	※	1
		★84-131-044	RUBBER SHEET (LX-120) (U only)	※	1
	3	★84-133-008	TURN-TABLE (LX-80)	LX-30	1
		★84-128-001	TURN-TABLE (LX-120)	LX-50	1
	4	84-133-213	RUBBER BELT T.T (LX-80)	LX-30	1
	5	★84-124-239	SPACER T.T	LX-70	2
	6	★84-131-035	PLATE U B	※	1
	7	★84-124-238	SCREW	LX-70	1
	8	★84-131-204	C-SPRING, EARTH (LX-120)	※	1
	9	★84-132-018	MAIN CABINET Ass'y F (LX-80)	※	1
		★84-131-046	MAIN CABINET Ass'y F (LX-120)	※	1
	9a	★82-798-209	C-SPRING, POWER	MX-90	1
	9b	★84-131-031	POWER KNOB B Ass'y	※	1
	9c	★84-131-020	PUSH-KEY, L	※	1
	9d	★84-131-040	PUSH-KEY, R	※	1
	10	★84-133-009	KNOB, SPEED	LX-30	2
	11	★84-133-224	HOLDER SHAFT Ass'y F (LX-80)	LX-30	1
	12	★84-133-225	C-SPRING, EARTH (LX-80)	LX-30	1
	13	★84-130-012	RUBBER FOOT		3
	14	★84-133-223	HEADER SCREW, RUBBER FOOT	LX-30	3
	15	★84-131-202	BOTTOM CABINET Ass'y F	※	1
	15a	84-122-210	GEAR A, WORM	AP-D80	1
	15b	★84-130-012	RUBBER FOOT		1
	15c	★84-133-203	E-SPRING, LINEAR	LX-30	1
	15d	★84-133-204	WIRE ROPE	LX-30	1
	15e	★84-133-212	PULLEY A, WORM	LX-30	1
	15f	★84-133-215	PIPE	LX-30	1
	15g	★84-133-222	HEADER SCREW	LX-30	1
	15h	★84-133-223	HEADER SCREW, RUBBER FOOT	LX-30	1
	15i	87-071-019	ROLLER ø7		3
	15j	★87-073-006	STEEL BALL 3		1
	15k	★84-131-205	MECHANISM CHASSIS Ass'y F12		1
	15l	82-439-342	COUNTER BELT		1
	15m	★84-123-238	E-SPRING, SENSOR	LX-100	1
	15n	84-124-204	GEAR A, WORM	LX-70	1
	15o	★84-127-206	MOTOR PULLEY S		1
	15p	★84-131-206	E-SPRING, P CIRCUIT BOARD	※	1
	15q	★84-131-208	C-SPRING, UP	※	1
	15r	★84-133-207	LEVER A	LX-30	1
	15s	★84-131-217	E-SPRING, P	※	1
	15t	★84-133-221	CAM A, UP-DOWN	LX-30	1
	16	★87-067-171	STE-6		1
	17	★84-135-013	PLATE O B		1
	18	87-085-199	CORD BUSHING		1
	19	★87-034-958	AC POWER CORD (H only)		1
		★87-034-578	AC POWER CORD (U only)		1
		★87-034-877	AC POWER CORD (E only)		1
		★87-034-711	AC POWER CORD (K only)		1
	20	★84-133-618	PIN CORD CN (H, E, K only)	LX-30	1
		★84-133-638	PIN CORD U CN (U only)	LX-30	1
	21	★84-133-617	SYNCHRATE CORD CN (H, E, K only)	LX-30	1
		★84-133-637	SYNCHRATE CORD U CN (U only)	LX-30	1
	22	★84-131-101	TONE-ARM Ass'y		1
	23	★87-081-483	MOTOR SCREW M2.6		2

■ACCESSORIES/PACKAGE LIST

LX-80

Part No. changed to	Ref. No.	Part No.	Description	Common Model	Q'ty	
	1	★84-132-904	INSTRUCTION BOOKLET	※	1	
	2	★84-190-978	45 ADAPTOR, S BLACK		1	

LX-120

Part No. changed to	Ref. No.	Part No.	Description	Common Model	Q'ty	
	1	★84-131-904	INSTRUCTION BOOKLET	※	1	
	2	★84-190-978	45 ADAPTOR, S BLACK		1	

AIWA Co., Ltd. Tokyo Japan

Printed in Japan